Amendments to the Claims

The listing of claims will replace all prior versions, and listings of claims in the application.

1. (previously presented) A method for maintaining synchronization in a communication system wherein a central entity transmits a signal containing timing information to one or more remote devices, the one or more remote devices using the timing information for scheduling transmissions, the method comprising:

receiving a first signal from the central entity and generating a symbol clock based on timing information included in the first signal;

upon a loss of reception of the first signal, maintaining the symbol clock;

receiving a second signal from the central entity; and

determining a symbol clock offset between the first signal and the second signal using the maintained symbol clock; and

adjusting the maintained symbol clock based on the symbol clock offset to generate an adjusted symbol clock.

2. (Original) The method of claim 1, further comprising:

providing the adjusted symbol clock to a transmitter.

3. (previously presented) The method of claim 1, further comprising:

detecting a loss of reception of the first signal.

4. (previously presented) The method of claim 1, wherein determining the symbol clock offset using the maintained symbol clock comprises identifying a symbol clock offset value that obtains a valid alignment for forward error correction (FEC) decoding of the data in the second signal.

5. (previously presented)The method of claim 1, wherein determining the symbol clock offset using the maintained symbol clock comprises identifying a symbol clock offset value that obtains a valid puncture alignment for Trellis Coded Modulation (TCM) decoding of the data in the second signal.

6. (previously presented) The method of claim 1, wherein determining the symbol clock offset using the maintained symbol clock comprises identifying a symbol clock offset value that obtains a valid frame alignment for Reed-Solomon decoding of the data in the second signal.

7. (previously presented) A method for maintaining synchronization in a communication system wherein a central entity transmits a signal containing timing information to one or more remote devices, the one or more remote devices using the timing information for scheduling transmissions, the method comprising:

receiving a first signal from the central entity and generating a symbol clock based on timing information included in the first signal;

upon a loss of reception of the first signal, maintaining the symbol clock;

receiving a second signal from the central entity;

determining a symbol clock offset between the first signal and the second signal using the maintained symbol clock;

wherein determining the symbol clock offset using the maintained symbol clock comprises:

identifying a first symbol clock offset that obtains a valid puncture alignment for Trellis Coded Modulation (TCM) decoding of first encoded data in the second signal;

identifying a second symbol clock offset that obtains a valid frame alignment for Reed-Solomon decoding of second encoded data in the second signal; and

combining the first symbol clock offset and the second symbol clock offset to generate a combined symbol clock offset; and

adjusting the maintained symbol clock based on the symbol clock offset to generate an adjusted symbol clock;

8. (previously presented) A method for maintaining synchronization in a communication system wherein a central entity transmits a signal containing timing information to one or more remote devices, the one or more remote devices using the timing information for scheduling transmissions, the method comprising:

receiving a first signal from the central entity and generating a symbol clock based on timing information included in the first signal;

receiving calibration information from the central entity relating to a difference in forward error correction (FEC) alignment between the first and second signals;

upon a loss of reception of the first signal, maintaining the symbol clock;

receiving a second signal from the central entity;

determining a symbol clock offset between the first signal and the second signal using the maintained symbol clock,

wherein determining the symbol clock offset includes accounting for the difference in FEC alignment between the first and second signals; and

adjusting the maintained symbol clock based on the symbol clock offset to generate an adjusted symbol clock.

9. (previously presented) The method of claim 1, further comprising:

receiving a notification message from the central entity indicating that the first signal will be terminated.

10. (previously presented) A method for maintaining synchronization in a communication system wherein a central entity transmits a signal containing timing information to one or more remote devices, the one or more remote devices using the timing information for scheduling transmissions, the method comprising:

receiving a signal from the central entity;

generating a symbol clock based on timing information included in the signal;

storing information associated with the timing information to provide delayed timing information; and

upon a loss of reception of the signal, accessing the delayed timing information to maintain the symbol clock.

11. (Original) The method of claim 10, wherein storing the information associated with the timing information includes storing the information for a predetermined period of time.

12. (previously presented) The method of claim 10, wherein accessing the delayed timing information includes accessing the delayed timing information representative of a time period immediately before the loss of reception of the signal.

13. (previously presented) The method of claim 10, wherein accessing the delayed timing information includes accessing the delayed timing information representative of a time period ending at least one clock cycle before the loss of reception of the signal.

14. (Original) The method of claim 10, wherein storing information associated with the timing information includes storing the information received from at least one of a loop filter, a numerically controlled oscillator, and a voltage controlled oscillator.

15. (previously presented) The method of claim 10, further including analyzing the information associated with the timing information to determine when the loss of reception of the signal occurs.

16. (currently amended) An apparatus in a communication system, the apparatus comprising:

a receiver configured ~~adapted~~ to receive a plurality of signals from a central entity;

a clock generation element configured ~~adapted~~ to generate a symbol clock based on timing information included in a first signal received by the receiver and to maintain the symbol clock upon a loss of reception of the first signal; and

an offset determination element configured ~~adapted~~ to determine a symbol clock offset between the first signal and a second signal received by the receiver using the maintained symbol clock; and

an upstream timing element configured to adjust the maintained symbol clock based on the symbol clock offset to generate an adjusted symbol clock.

17. (currently amended) The apparatus of claim 16 further including a transmitter configured ~~adapted~~ to receive the adjusted symbol clock.

18. (currently amended) The apparatus of claim 16 further including a loss detection element configured ~~adapted~~ to detect a loss of reception of the first signal.

19. (currently amended) The apparatus of claim 16, wherein the offset determination element is configured ~~adapted~~ to determine the symbol clock offset by identifying a symbol clock offset that obtains a valid alignment for forward error correction (FEC) decoding of the data in the second signal.

20. (currently amended) The apparatus of claim 16, wherein the offset determination element is configured ~~adapted~~ to determine the symbol clock offset by identifying a symbol clock offset that obtains a valid puncture alignment for Trellis Coded Modulation (TCM) decoding of the data in the second signal.

21. (currently amended) The apparatus of claim 16, wherein the offset determination element is configured ~~adapted~~ to determine the symbol clock offset by identifying a symbol clock offset that obtains a valid frame alignment for Reed-Solomon decoding of the data in the second signal.

22. (currently amended) An apparatus in a communication system, the apparatus comprising:

a receiver configured ~~adapted~~ to receive a signal from a central entity;

a clock generation element configured ~~adapted~~ to generate a symbol clock based on timing information included in a first signal and to maintain the symbol clock upon a loss of reception of the first signal;

an offset determination element configured ~~adapted~~ to determine a symbol clock offset between the first signal and a second signal using the maintained symbol clock,

wherein the offset determination element identifies a first symbol clock offset that obtains a valid puncture alignment for Trellis Coded Modulation (TCM) decoding of first encoded data in the second signal, identifies a second symbol clock offset that obtains a valid frame alignment for Reed-Solomon decoding of second encoded data in the second signal, and combines the first symbol clock offset and the second symbol clock offset to generate a combined symbol clock offset; and

an upstream timing element configured to adjust the maintained symbol clock based on the symbol clock offset to generate an adjusted symbol clock.

23. (currently amended) An apparatus in a communication system, the apparatus comprising:

a receiver configured ~~adapted~~ to receive a signal from a central entity,

wherein the receiver receives calibration information from the central entity relating to a difference in forward error correction (FEC) alignment between the first signal and the second signal prior to receiving the second signal;

a clock generation element configured ~~adapted~~ to generate a symbol clock based on timing information included in a first signal and to maintain the symbol clock upon a loss of reception of the first signal;

an offset determination element configured ~~adapted~~ to determine a symbol clock offset between the first signal and a second signal using the maintained symbol

clock, wherein the symbol clock offset determination includes accounting for the difference in FEC alignment between the first signal and the second signal; and

an upstream timing element configured to adjust the maintained symbol clock based on the symbol clock offset to generate an adjusted symbol clock.

24. (previously presented) The apparatus of claim 16, wherein the offset determination element determines the symbol clock offset in response to the receiver receiving the second signal and a notification message from the central entity indicating that the first signal will be terminated.

25. (Original) The apparatus of claim 16, wherein the apparatus is a cable modem.

26. (previously presented) An apparatus in a communication system, the apparatus comprising:

means for receiving a signal from a central entity;

means for generating a symbol clock based on timing information included in the signal;

means for storing information associated with the timing information to provide delayed timing information; and

means for accessing the delayed timing information upon a loss of reception of the signal to maintain the symbol clock.

27. (Original) The apparatus of claim 26, wherein the means for storing the information store the information for a predetermined period of time.

28. (previously presented) The apparatus of claim 26, wherein the delayed timing information is representative of a time period immediately before the loss of the reception of the signal.

29. (previously presented) The apparatus of claim 26, wherein the delayed timing information is representative of a time period ending at least one clock cycle before the loss of reception of the signal.

30. (Original) The apparatus of claim 26, wherein the means for storing information store the information received from at least one of a loop filter, a numerically controlled oscillator, and a voltage controlled oscillator.

31. (previously presented) The apparatus of claim 26, further including means for analyzing the information associated with the timing information to determine when the loss of reception of the signal occurs.

32. (previously presented) The apparatus of claim 26, wherein the apparatus is a cable modem.

33. (previously presented) The method of claim 1, wherein the second signal is the first signal from the central entity re-acquired after the loss of reception.

34. (previously presented) The method of claim 1, wherein determining the symbol clock offset comprises incrementing a counter based on the maintained symbol clock during the time period between the loss of the first signal and receipt of the second signal.

35. (previously presented) The method of claim 1, wherein determining the symbol clock offset comprises identifying a symbol clock offset value that obtains a valid packet alignment for Moving Pictures Experts Group (MPEG) data in the second signal.

36. (previously presented) The apparatus of claim 16, wherein the second signal is the first signal re-acquired by the receiver after the loss of reception.

37. (currently amended) The apparatus of claim 16, wherein the offset determination element comprises a counter configured ~~adapted~~ to increment based on the maintained symbol clock during a time period between the loss of reception of the first signal and the receiver receiving the second signal.

38. (currently amended) The apparatus of claim 16, wherein the offset determination element configured ~~adapted~~ to determine the symbol clock offset by

identifying a symbol clock offset value that obtains a valid packet alignment for Moving Pictures Experts Group (MPEG) data in the second signal.

39. (currently amended) A communication system, comprising:

a central entity comprising

a first transmitter configured ~~adapted~~ to transmit[[ting]] a first transmitter signal, wherein the first transmitter signal contains timing information based on a first central symbol clock; and

a remote device comprising

a receiver configured ~~adapted~~ to receive a first received signal, wherein the first received signal is the first transmitter signal as received from the central entity;

a clock generation element configured ~~adapted~~ to

generate a remote symbol clock based on the first received signal, and

maintain the remote symbol clock upon a loss of reception of the first received signal; and

an offset determination element configured ~~adapted~~ to determine a remote symbol clock offset between the first received signal and a second received signal using the maintained remote symbol clock.

40. (currently amended) The system of claim 39 [[42]], wherein the second received signal is the first transmitter signal as re-acquired by the receiver after the loss of reception of the first received signal.

41. (currently amended) The system of claim 39, the remote device further comprising

an upstream timing element configured ~~adapted~~ to adjust the maintained remote symbol clock based on the remote symbol clock offset to generate an adjusted remote symbol clock.

42. (currently amended) The system of claim 41, the remote device further comprising

a remote device transmitter configured ~~adapted~~ to receive the adjusted remote symbol clock.

43. (currently amended) The system of claim 39, the central entity further comprising

a second transmitter configured ~~adapted~~ to transmit[[ting]] a second transmitter signal, wherein the second transmitter signal contains timing information based on a second central symbol clock.

44. (currently amended) The system of claim 43, the central entity further comprising

a synchronization element configured ~~adapted~~ to synchronize the first central symbol clock and the second central symbol clock.

45. (currently amended) The system of claim 39, the remote device further comprising

a loss detection element configured ~~adapted~~ to detect the loss of reception of the first received signal.

46. (previously presented) The system of claim 39, wherein the offset determination element further comprises a counter that is incremented based on the maintained remote symbol clock during a time period between the loss of reception of the first signal and the receiver receiving the second signal.

47. (currently amended) The system of claim 39, wherein the offset determination element is further configured ~~adapted~~ to obtain a valid packet alignment for Moving Pictures Experts Group (MPEG) data in the second received signal.

48. (currently amended) The system of claim 39, wherein the offset determination element is further configured ~~adapted~~ to obtain a valid alignment for forward error correction (FEC) decoding of the data in the second received signal.

49. (currently amended) The system of claim 39, wherein the offset determination element is further configured ~~adapted~~ to obtain a valid puncture alignment for Trellis Coded Modulation (TCM) decoding of the data in the second received signal.

50. (currently amended) The system of claim 39, wherein the offset determination element is further configured ~~adapted~~ to obtain a valid frame alignment for Reed-Solomon decoding of the data in the second received signal.

51. (previously presented) The system of claim 39, wherein the offset determination element identifies a first symbol clock offset that obtains a valid puncture alignment for Trellis Coded Modulation (TCM) decoding of first encoded data in the second signal, identifies a second symbol clock offset that obtains a valid frame alignment for Reed-Solomon decoding of second encoded data in the second signal, and combines the first symbol clock offset and the second symbol clock offset to generate a combined symbol clock offset.

52. (previously presented) The system of claim 39, wherein

the receiver receives calibration information from the central entity relating to a difference in forward error correction (FEC) alignment between the first signal and the second signal prior to receiving the second signal,

and the symbol clock offset determination includes accounting for the difference in FEC alignment between the first signal and the second signal.

53. (previously presented) The system of claim 39, wherein the offset determination element determines the symbol clock offset in response to the receiver receiving the second signal and a notification message from the central entity indicating that the first signal will be terminated.

54. (previously presented) The system of claim 39, wherein the central entity is a cable modem termination system and the remote device is a cable modem.

55. (previously presented) A method for maintaining synchronization in a communications system, comprising:

transmitting a first transmitted signal from a central entity to one or more remote devices, wherein the first transmitted signal includes timing information based on a first central symbol clock;

receiving a first received signal, wherein the first received signal is the first transmitted signal as received from the central entity, and generating a remote symbol clock based on timing information included in the first received signal;

upon a loss of reception of the first received signal, maintaining the remote symbol clock;

receiving a second received signal;

determining a symbol clock offset between the first received signal and the second received signal using the maintained remote symbol clock; and

adjusting the maintained symbol clock based on the symbol clock offset to generate an adjusted symbol clock.

56. (previously presented) The method of claim 55, further comprising:

detecting the loss of reception of the first received signal.

57. (previously presented) The method of claim 55, wherein the determining a symbol clock offset comprises identifying a symbol clock offset value that obtains a valid alignment for forward error correction (FEC) decoding of the data in the second signal.

58. (previously presented) The method of claim 55, wherein the determining a symbol clock offset comprises identifying a symbol clock offset value that obtains a valid puncture alignment for Trellis Coded Modulation (TCM) decoding of the data in the second signal.

59. (previously presented) The method of claim 55, wherein determining a symbol clock offset comprises identifying a symbol clock offset value that obtains a valid frame alignment for Reed-Solomon decoding of the data in the second signal.

60. (previously presented) The method of claim 55, wherein determining a symbol clock offset comprises:

identifying a first symbol clock offset value that obtains a valid puncture alignment for Trellis Coded Modulation (TCM) decoding of first encoded data in the second signal;

identifying a second symbol clock offset value that obtains a valid frame alignment for Reed-Solomon decoding of second encoded data in the second signal; and

combining the first symbol clock offset value and the second symbol clock offset value to generate a combined symbol clock offset.

61. (previously presented) The method of claim 55, further comprising:

receiving calibration information from the central entity relating to a difference in forward error correction (FEC) alignment between the first and second received signals;

wherein determining a symbol clock offset includes accounting for the difference in FEC alignment between the first and second received signals.

62. (previously presented) The method of claim 55, further comprising:

receiving a notification message from the central entity indicating that the first signal will be terminated.

63. (previously presented) The method of claim 55, further comprising:

providing the adjusted symbol clock to a transmitter.

64. (previously presented) The method of claim 55, wherein the second received signal is the first transmitted signal re-acquired after the loss of reception.

65. (previously presented) The method of claim 55, wherein determining the symbol clock offset comprises incrementing a counter based on the maintained symbol clock during the time period between the loss of the first received signal and receipt of the second received signal.

66. (previously presented) The method of claim 55, wherein determining a symbol clock offset comprises identifying a symbol clock offset value that obtains a valid packet alignment for Moving Pictures Experts Group (MPEG) data in the second signal.

67. (previously presented) The method of claim 55, further comprising:

synchronizing the first central symbol clock and a second central symbol clock; and

transmitting a second transmitted signal to one or more remote devices, wherein the second transmitted signal includes timing information based on a second central symbol clock.

68. (previously presented) The method of claim 67, wherein the second received signal is the second transmitted signal as received from the central entity.

69. (previously presented) The method of claim 67, further comprising:

transmitting a notification message to the one or more remote devices indicating that the first transmitted signal will be terminated prior to the termination of transmission of the first transmitted signal.

70. (previously presented) The method of claim 67, further comprising:

transmitting calibration information relating to a difference in FEC alignment between the first and second transmitted signals.